

## **ABSTRACT OF THE DISCLOSURE**

In a finite state machine ( $FSM_{verify}$ ) a set of goal states, to be searched for their reachability from a start state, is defined.

An overapproximated path is found from a start state to a goal state by a

5 forward approximation technique. The overapproximated path representation  
 relies upon a partitioning of the state and input bits of  $FSM_{verify}$ . A state matrix of  
 the overapproximated path is organized by time-steps of  $FSM_{verify}$  along a first  
 dimension and by partitions of  $FSM_{verify}$  state bits along a second dimension.

An underapproximated path, along the path of the stepping stone matrix,

10 is determined. Underapproximation is typically accomplished by simulation.

A sequence of states to be output is updated with the underapproximated path.

If a start to goal state sequence has been found, the procedure ends.

Otherwise, the above steps of over and under approximation are repeated, using the results of the last underapproximation as a start state.